BOTANICAL GAZETTE.

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Antirrhina Prehensilia.

BY A. GRAY.

The Californian species of this group (in the section *Antirrhinastrum*) have been somewhat increased in number since the revision in the Synoptical Flora. The following key may help to a better understanding of them:

Flowers comparatively large, in a naked spike: lower lip of corolla (with very protuberant palate and comparatively short lobes) very much larger than the upper: seeds lightly reticulate-favose (truly mature seeds still a desideratum). A. COULTERIANUM, Benth.

Flowers smaller (not over 4 lines long), with lower lip of corolla not very much larger than the upper, and sepals not conspicuously unequal,

Approximate in rather loose spiciform racemes, which are naked, except for the tendril-like branchlets they often produce: leaves linear or lowest spatulate-lanceolate: plants glabrous up to the inflorescence.

Seeds tuberculate-favose. A. ORCUTTIANUM, n. sp.

Seeds longitudinally cristate-costate. A. NIVENIANUM, n. sp.

Scattered: leaves ovate or oblong: herbage glandular or viscid-pubescent: seeds longitudinally cristate-costate.

Leaves petioled, mostly subtending axillary slender-peduncled flowers: stems and branches at length diffuse. A. NUTTALLIANUM, Benth.

Leaves all sessile or nearly so, upper more reduced and bract-like: peduncles shorter than the more approximate and racemose flowers, often shorter than the calyx: stem erect. A. SUBSESSILE, n. sp.

Scattered, small, short-peduncled: leaves mostly narrowly linear: plant glabrous: seeds scrobiculate-tuberculate. A. KINGII, Wats.

Flowers not small, scattered, subsessile or short-peduncled in the axils of oblong or lanceolate short-petioled leaves: sepals very unequal, upper one larger: tube of the corolla rather longer than the lips, of which the lower is comparatively large but short: seeds undulately cristate and at length rugose-tuberculate.

Corolla half an inch long; upper lip nearly equalled by the oblong large upper sepal. A. VAGANS, Gray.

Corolla smaller and narrower; its tube surpassing the upper sepal. A. BREWERI, Gray.

A. ORCUTTIANUM has been collected within the last year or two, mainly by Mr. C. R. Orcutt, near San Diego, and also in adjacent parts of Lower California. At first it was thought to be possibly a small-flowered state of *A. Coulterianum*. Sometimes, as in that species, the spiciform raceme bears hardly any filiform branches: sometimes they are produced in extreme abundance.

A. NIVENIANUM was collected by the Rev. Mr. Nevin at San Juan Capistrano, Los Angeles Co., in 1882. I think we have an immature specimen of the same from near San Diego. It much resembles the foregoing except in the seeds.

A. SUBSESSILE we have from Santa Catalina Island, collected by Mr. Schumacher in 1878; from Chollas Valley, San Diego Co., by Mr. Orcutt, 1883; both in fruit; and specimens from near San Diego, collected by Mr. Cleveland in 1874 and 1875, young flowering plants, appear to be of the same species, although they had been taken for *A. Nuttallianum*. The sessile leaves and short-peduncled flowers ought to distinguish it.

Schedule of North American Species of Paspalum.

BY GEO. VASEY.

PASPALUM, Linn.

Section EUPASPALUM, Benth. Spikelets arranged alternately, singly or in pairs, along the central elevated ridge of the rhachis (not immersed in it), the lower empty glume and the flowering one facing the ridge or rhachis.

Subsection *Opisthion*, Benth. Two empty or outer glumes: the narrow rhachis of the spikes flat or rarely somewhat concave.

a. Spike single and terminal.

1. *P. rectum*, Nees, var. *longispicata* (P. monostachyum, Vasey).

b. Spikes in terminal pairs, or rarely 3 and approximate.

2. *P. conjugatum*, Berg. Mississippi and Louisiana.
3. *P. notatum*, Flugge. On ballast ground, Philadelphia.
4. *P. distichum*, Linn.
5. *P. variegatum*, Swz. (P. Reimarioides, Chapm.)

c. One terminal, and usually a second approximate spike, with remote lateral peduncled ones.

6. *P. setaceum*, Michx. and varieties.

d. Spikes 2 to 5, or rarely 7, approximate or the lower ones rather distant.

7. *P. racemulosum*, Nutt.
8. *P. laxe*, Michx.
9. *P. Walterianum*, Schult.
10. *P. cæspitosum*, Flugge.
11. *P. remotum*, Remy.
12. *P. Floridanum*, Michx.
13. *P. giganteum*, Baldw. ined.
14. *P. lividum*, Trin.
15. *P. lentiginosum*, Presl.
16. *P. lentiferum*, Lam. (P. præcox, Walt.)
17. *P. dilatatum*, Poir. (P. ovatum, Trin.)
18. *P. elatum*, Richard in Herb. Paris.

e. Spikes more numerous, 7 to 20 or more.

19. *P. virgatum*, Linn., var. *platyoxon*, Doell.
20. *P. purpurascens*, Elliott.
21. *P. plicatulum*, Michx. (P. undulatum, Poir.)

Subsection *Pseudoceresia*, Benth. (*Ceresia*, Elliott.) Empty or outer glumes, 2. Spikes numerous, spreading, the rhachis more or less dilated, concave, thin and green: the spikelets small and smooth.

22. *P. fluitans*, Kunth. (Ceresia fluitans, Ell.)

Section ANASTROPHUS, Benth. Spikelets on each side of the rhachis of the narrow subflexuous spike, sessile, alternate, mostly in two rows, the lower empty glume and the flowering one turned away from the rhachis (*Spiculæ inversæ*, Nees): the spikes often many, close, suberect.

23. *P. platycaule*, Poir. (P. compressum, Nees.)
24. *P. Digitaria*, Poir? Chapman's Flora.

NOTES.—No. 1, collected by Dr. Garber, at Miami, Florida. The culm is much stouter and the spike much longer than in the typical plant.

Nos. 4 and 5. There is much confusion respecting these species if they are separate. Mr. Bentham makes them synonymous, but there certainly appear to be two species. The *P. vaginatum*, Swz., has prostrate or decumbent culms, growing in water or marshy ground, and *very* acute glumes. The other species has a running rhizome with erect culms, shorter and broader leaves, and barely acute glumes.

No. 6. It is difficult to separate *P. debile* and *P. ciliatifolium*, at least as species. They appear to be only varieties.

No. 10 includes *P. Blodgettii*, Chapm.

No. 11, No. 804 of E. Hall's Texas collection, is thus named by Munro.

No. 13 is represented in the Philadelphia Academy collection from Baldwin. It has since been collected by Mr. Curtiss and appears to be a good species.

No. 14, No. 807 of E. Hall's Texas collection, named by Munro.

No. 15 is No. 364 of Drummond's collection, and is also in Herb. Gray from Key West, collected by Blodgett.

No. 19 is in Herb. Gray, ticketed by Munro from a specimen collected in Texas by Mr. Reverchon. It is, perhaps, the same as No. 20, which we have from Virginia and South Carolina, and appears very different from *P. virgatum*, Linn.

No. 21 is 801 of E. Hall's Texas collection. It occurs also from other sources.

No. 24 is the plant of Chapman's Flora, but his synonym should probably be excluded. Doell cites *Milium paspaloides*, Ell., *Digitaria paspaloides*, Michx., and *Milium distichum*, Muhl., as synonyms of *P. vaginatum*, Swz. It is nearly related to No. 23, but would seem to be specifically distinct. The *P. obtusifolium* of Chapman's Supplement is *P. platycaule*, Poir. *P. obtusifolium*, Raddi, and *P. barbatum*, Schultes, are both made synonyms of *P. furcatum*, Flugge, by Doell in Gram. Bras., and it is possible that Chapman's *P. Digitaria* may also be that species.

A Botanical Holiday in Nova Scotia. IV.

BY T. J. W. BURGESS, M. D.

Twenty-six miles in the little steamer May Queen over another branch of the great inland sea, and we had reached mountain locked Whycocomagh, or, as it is generally called by the natives Hogomah. The greater part of the three days spent here was devoted to drying purposes, but a couple of very successful excursions were made. One up a rocky gorge in the mountains rewarded us with *Impatiens pallida*, Nutt., *Solidago thyrsoidea*, E. Meyer, *Milium effusum*, L., *Asplenium thelypteroides*, Mx., and two very peculiar forms of *Cystopteris fragilis*, Bernh. The first of these forms, found growing abundantly under the spray of a little fall, in deeply shaded crevices of the rock, fell under the var. *dentata*, Hook., and was remarkable for the great length of

the fronds. Their general measurement was not less than eleven or twelve inches, but many of them were fifteen and sixteen, and some even nineteen inches long. The second form, gathered in another part of the same ravine, occupied the crevices of drier and but slightly shaded rocks, and approached the var. *angustata*, but the ends of the fronds, as well as of most of the pinnæ and some of the primales, showed a tendency to bifurcate. The forking was not confined to a single plant, but was common to all in the patch, which was of considerable extent. Prof. Eaton, to whom specimens were submitted, says that this form is unlike any that he has seen before, and suggests that it be called var. *multifida*, Wolleston, as Mr. Moore in his "Nature Printed British Ferns" has such a variety and says of it, "In this, which is not permanent, the apices of the pinnæ or of the frond are bifid or multifid, or the stipes divided." Excursion number two had for its object the climbing of Salt Mountain, from the summit of which we had a splendid view. The Bras D'Or with its myriad of radiating arms was spread before us like a network of silver threads, while Cape Porcupine, at the Gut of Canso, on the one hand, and the smoke rising from Sydney mine on the other, with all the country between, were quite readily discernible. The side of the mountain, very steep and partially wooded, was a grand conservatory for ferns, which were disposed in regular series with the boundaries of each quite sharply defined. *Aspidium marginale*, Swz., growing with which was *Asplenium Filix-foemina*, Bernh. var. *angustum*, D. C. Eaton, formed the lowest layer, and was succeeded by one of *Aspidium spinulosum*, Swz. var. *dilatatum*, Hook., while a magnificent growth of *Aspidium Filix-mas*, Swz. came next, and *Woodsia Ilvensis*, R. Br. occupied the exposed faces of the topmost rocks. The fronds of the male fern, many of which were fully three feet in length, differed from the form usually described in being rather narrowly lanceolate in outline, the tallest of them measuring only five inches across where broadest.

The time fixed for the Professor's leaving me to visit the Island of Anticosti was drawing speedily onward, and it became necessary for us to hasten back to Pictou where we knew several rarities were to be had. Flying glimpses were taken of Pirate's Harbor and New Glascow, *Campanula rapunculoides*, L. being seen growing plentifully along the railway track at the latter place, and on the evening of July 24th we had arrived. The early part of the next day was devoted to an examination of the ballast heaps along the quays, and *Senebiera Coronopus*, Poir.,

Viola tricolor, L., *Trifolium arvense*, L., *Vicia tetrasperma*, Loisel., *Carduus nutans*, L., *Polygonum lapathifolium*, Ait., *Mercurialis annua*, L., and a number of other introduced plants, not yet determined, were our prizes. Noon, however, came all too surely bringing the sundering of our very pleasant, and to me, instructive, two months' companionship; Mr. Macoun starting for Quebec where he was to catch the Government steamer, whilst I, having determined to work my way home by the White Mountains, remained over for a couple of days botanizing with Mr. McKay, Principal of the Pictou Academy, and an enthusiastic naturalist. In tramping about the vicinity *Senecio Jacobæa*, L., was found to be one of the commonest weeds, its golden heads brightening the fields and roadsides in every direction. It is locally known as "Stinking Willie," and the eating of it was at one time popularly believed to be the cause of a disease prevalent among the cattle about Pictou for the past forty years. Experiment, however, abundantly disproved this, and by proper sanitary precautions the disease has been just about stamped out. Plentiful, but not quite so much so as the Jacobœa, was *Senecio viscosus*, L., and *Matricaria inodora*, L. was not infrequent. *Bartsia Odontites*, Huds , just coming into flower, was poking its head up everywhere, while *Camelina sativa*, Crantz, and *Euphorbia Peplus*, L. were detected bordering some of the streets.

Leaving Pictou, a stop, long enough for a farewell visit to the falls, was made at Truro, which place was quitted on the 27th July for St. John, New Brunswick, on the road for my western home again.

The results of our work in Nova Scotia may be thus summed up. The names and locations of over 700 phænogams and vascular cryptogams were recorded, and specimens of most of them preserved. Of these, over 200 had not, so far as I am aware, been given in any published list of the Nova Scotia flora. Of the flowering plants, the orders to which, as mentioned by Dr. Sommers, an able Halifax botanist, in his "Introduction to a Synopsis of the Flora of Nova Scotia," least attention had been paid by local workers, the *Cyperaceæ* and *Gramineæ*, furnished, in proportion, by far the greater part of the additions, the number being 66 of the former and 34 of the latter. *Compositæ* came next, claiming 15, while *Crucifera* and *Juncaceæ* each had 8, and the remainder were scattered amongst the other orders. In vascular Cryptogams, the *Filices* having been very exhaustively studied by the Rev. E. Ball, our new finds were limited to *Boeltrychium matricariæ folium*, *Asplenium Felix-fœmina*, var. *angust-*

um, and *Isoetes Tuckermani*. Of the *Musci*, *Hepaticæ*, and *Lichenes* the bulk have still to be worked up, so that it is impossible as yet to give an anyway accurate report of the total number of species found or additions made.

Elihu Hall.

BY MRS. J. M. MILLIGAN.

For want of sufficient data the publication of this brief tribute has been delayed.

Mr. Hall was born June, 1822, in Patrick county, Virginia, and died September, 1882. As a young man Mr. Hall was strong, healthy and full of ambition. In the winter of 1846, by severe over-exertion, he brought on an almost fatal hemorrhage from the lungs, and during the following years of his life he was subject to hemorrhages whenever his physical strength was overtaxed. This weakened condition of his body induced him to seek out-door recreation, not only as a means of obtaining such moderate share of health as might be his, but to find occupation for his active mind. He knew nothing of text-books, had never attended school, or had any scholarly associates, but

> "Nature, the old nurse, took
> The child upon her knee,
> Saying, 'Here is a story book
> Thy Father has written for thee.'"

And the "child" turned the leaves with an industrious hand and read many things about the bird, insect and plant life around him. With enthusiasm he noted every plant within his reach, made himself familiar with the characteristics of each species, and soon learned to classify them according to their general resemblances. He had never heard of drying plants to preserve them for specimens. In order that others might see what he had seen, he set to work with patient diligence to learn to draw and color each species as he gathered it fresh from the fields. Naturally his first attempts were crude and stiff, but his progress was rapid, for he copied only from the works of the Great Master, and he was armed with a sturdy determination to succeed. Colored drawings of three hundred and fifty species of plants were the result of his first summer's work, besides a number of well-executed drawings of birds, also colored. Mr. Hall was not long in discovering that others must have gone over at

least some of the same ground. He began to correspond with scientific men, sent for books, and a new world was opened to him. Botany, his favorite study, became more than ever a joy to him. He did not follow it for money or fame, never seeking to impress himself or his work upon others. He was one of Carlyle's pattern silent men, too occupied by his work to be drawn aside from it by the trivialities of social life. He became famous with scientific men at home and abroad, while his neighbors only knew him as the plain, honest "Eli" and a most trusty citizen. Mr. Hall had good mathematical abilities, and had made himself master of trigonometry and surveying. He was elected surveyor of Menard county, for which office he was fully competent. He ran his "lines" well, but on such tramps plants were his chief interest, and his field herbarium was more often consulted and added to than his "field notes." In his close observation of nature he resembled Thoreau, but his character in many things was rounded to a more agreeable perfection. His absorption in his loved science made no difference in the completeness with which he discharged all the duties of son, husband, father, neighbor and citizen. No labor that the comfort and welfare of others required was neglected in order that his favorite study might yield him its pleasures.

Although a member of no church organization, yet many instances are related of his Christian kindliness of character. It was said of him that there was no one whose friends would be more willing to send to heaven on his own merits than Mr. Hall, and no one who would be less willing to go on those grounds.

In the later years of Mr. Hall's life, when too feeble to go on collecting tours, he turned his attention to the study of shells. His collection of fresh water and land shells is probably the best in the State of Illinois. Some idea of the extent and value of his botanical collection may be gained from a mention of the sections of the United States that he had visited. He made extended trips into Colorado, Oregon, Texas, Arkansas and Michigan, and shorter trips into Missouri, Iowa, Kansas and Nebraska. He also made very complete collections of the plants of Central Illinois. His name is permanently associated with the plants of Oregon and Colorado. He discovered many new species, and the following list comprises a majority of the genera containing species named for him: Sticta, Rinodina, and Pilophorus, by Tuckerman; Bruchia, Campylopus, Conomitrium, Orthotrichum, and Archidium, by Austin; Juncus, by Englemann; Melica, by Vasey; Isopyrum, Viola, Aster, Aplopappus, Heuchera, Pentstemon, Dalea, Asclepias, Carum, Seseli, and Astragalus, by Gray.

Mr. Hall greatly enlarged his herbarium by extensive exchanges, both at home and abroad, and by additions from his botanic garden, in the cultivation of which he was wonderfully successful, making cuttings, seeds and roots grow that he collected on his various excursions and that were sent to him from all parts of the country. This garden was not only valuable scientifically, but was very lovely, even to those who had no botanical interest in it. On one side was a bank where those plants were placed that were sturdy enough to hold their own against native occupants, and these grew in the wildest luxuriance. For other plants, that could not unaided contend against the change of climate and soil, beds were carefully prepared and the foreigners alone were allowed to flourish in them. In other parts of the grounds curious and beautiful vines, shrubs and forest trees, in great variety, grew as if perfectly at home.

In a swampy hollow over fifty species of willow were planted. This garden afforded Mr. Hall much enjoyment. Many days of weakness and pain were made even beautiful to him while wandering among his plants with his wife and little ones, living over with them the delights of his pioneer collecting trips, when for the first time he saw this or that new species. Mr. Hall seemed indeed to be gifted with a more than usual share of that enthusiasm that envelops the possessor in an atmosphere of perpetual youth. It was said of him that he seemed two inches taller when he got into the woods, and his associates on his excursions used to declare that, although evidently far from strong, he tired them out, and it was difficult to keep up with him when on a botanical hunt.

There are some points in Mr. Hall's life which should not be passed over without special notice. One of these is the remarkable proficiency he attained through self-teaching; another, that he did not begin his education till after he had reached maturity; third, that he accomplished so much while contending against sickness. Curiously the love of nature slept within him unsuspected till the touch of suffering aroused his sleeping senses.

"And he wandered away and away
With Nature, the dear old nurse,
Who sang to him night and day
The rhymes of the universe.

"And whenever the way seemed long,
Or his heart began to fail,
She would sing a more wonderful song,
Or tell a more marvellous tale."

No doubt the sympathy and appreciation Mr. Hall met with in his home were potent aids to his success, but no one can see his herbarium and consider the labor, mental and physical, involved in amassing and classifying without being impressed with the great will power of this quaint, unconventional, manly character. "His work will not be forgotten or its effects lost."

NOTE.—Mr. Hall left his collections of plants, shells and insects in the care of Mrs. Hall, to be preserved by her till their youngest child is of age; then, if none of the children show a disposition to pursue these branches of study, all are to be disposed of.

GENERAL NOTES.

Bryanthus Gmelini, Don.—One of the most interesting re-discoveries of late is that of the above-named plant. Upon Behring Island, where it had long ago been found by Russian collectors, Dr. L. Steineger, U. S. N., last year collected a few specimens of this rare plant, which has afforded us an opportunity of examining the species. Three views have been held in respect to it. By Maximowicz it has been kept as the sole species of the genus; characterized by the 4-merous and octandrous flowers, with rotate and deeply 4-parted corolla. Bentham and Hooker keep up *Bryanthus*, adding to it the two American species of *Phyllodoce*, which have an open corolla, in one (*P. Breweri*) deeply 5-cleft, and stamens and style soon much exserted; in the other (*P. empetriformis*), merely 5-lobed, and stamens included. In the third place, I had brought the whole of *Phyllodoce* into the genus, making it a collective group of three sections. In this I was influenced by the analogy of *Cassiope*, in which the flowers are either 4-merous or 5-merous, and the corolla varies from 4 to 5-parted to 4 to 5-lobed. Now that I have seen the original *Bryanthus*, I should say that either the first or the third view may consistently be maintained. I should still prefer the latter. But the first has the advantage of giving us a genus which may be fairly distinguished from *Phyllodoce* on the one hand, while on the other it may be set against the nearly related *Loiseleuria*, distinguished by its 5-merous and 5-androus flowers, the corolla not so deeply parted, and the anther-cells dehiscent for their whole length.

Dr. Steineger's botanical collection from Behring Island and Copper Island (the Commander Islands, off the coast of Kamtschatka) contains many other plants of interest.—A. GRAY.

Cement for Mounting Plants.—Bisulphuret carbon, 4 ozs.; crude India rubber, sufficient quantity to make of the proper thickness. This is the best combination for the purpose of holding plants to mounting paper, as well as for other purposes, that can be made. It is always ready for use.—DR. J. H. OYSTER, *Paola, Kansas.*

Schweinitz and American Hepaticæ.—The paper on Schweinitz as a mycologist, in the February GAZETTE, suggests his relation to the study of American Hepaticæ. Michaux was the earliest writer on this group, describing 13 species, five of which were new (*Flora* II, 276–280), but Schweinitz published the first work devoted entirely to the hepatics. The work is now rarely seen, having been printed at Raleigh in 1821. Its full title is as follows: "*Specimen Floræ Americæ Septentrionalis Cryptogamicæ sistens Muscos Hepaticos hucusque in Am. Sept. observatos.*" As its title indicates, the work is entirely in Latin, and contains in its 27 pages descriptions of 77 species, of which 12 are regarded as new, if we include *Targionia orbicularis*,[1] which had been partially described by Michaux as *Jungermannia orbicularis*. Of these, 58 belonged to the single genus *Jungermannia*, not broken up then, as now, into so many genera. Of the eleven described as new, one, *Riccia lutescens*, has remained unchanged; one, *Jungermannia clypeata*, remains as *Phragmicoma clypeata*, Sulliv., while the remainder, viz., *Jungermannia ciliifera*, *J. distans*, *J. bipinnata*. *J. platyphylloidea*, *J. transversalis*, *J. oblonga*, *J. sinuata*, *Anthoceros laciniatus* and *A. jungermanioides* are consigned to the fellowship of other synonyms which so sadly mar(k) American botany, representing, as they do, an over ardent ambition unaccompanied by sufficient patient investigation.—LUCIEN M. UNDERWOOD, *Syracuse University*.

[NOTE.—In this connection it seems appropriate to say that Mr. Eugene Rau writes that Schweinitz was born in 1780, not 1794, as the February GAZETTE has it.—ED.]

"Four-leaved" Red Clover.—It may interest some of the readers of the BOTANICAL GAZETTE to hear of a plant of Red Clover which has come under my notice, which has borne a large number of leaves with four and five leaflets. It was taken up and potted in September, 1883, when it had some 15. It has now (January 28, 1884,) between 50 and 60, and fully 30 have been picked from it.—N. T. KIDDER, *Milton, Mass.*

Missouri Notes.—*Ammannia latifolia* has six and seven stamens in all the plants I have seen here.

Æsculus glabra almost always has seven leaflets in our plant.

Quercus Muhlenbergii is a large tree here, sometimes growing to the height of 60 or 70 feet, with a circumference of 10 feet at the foot.

Salix lucida grows very tall here, sometimes reaching the height of 60 feet, and is very abundant along the Missouri river; the flowers at the base of the ament have 6 to 9 stamens, while those of the apex have but five.

Verbena stricta with leaves whorled in threes, often in fives, with flowers white, blue, purple, or rose colored, are not uncommon.

Silphium integrifolium has the leaves often in threes.

Cnicus lanceolatus occurs with cream colored flowers.

Delphinium tricorne flowers abundantly here; on one specimen were counted 43 blossoms.

Dioscorea villosa has three cotyledons in our plants.

Vernonia Noveboracensis often has white flowers.—FRANK BUSH, *Independence, Missouri.*

[1] *Notothylas orbicularis*, Sulliv.

EDITORIAL NOTES.

PROF. L. F. WARD has completed the preparation of index slips for a catalogue of fossil plants.

PROF. JOHN H. BALFOUR, Professor of Botany in the University of Edinburg, died in February, aged 76.

MR. I. C. MARTINDALE has published an obituary notice of Chas. F. Parker, in the *Proc. Philad. Acad.* for 1883.

THERE WILL be printed in the next issue of the GAZETTE a complete list of Dr. Engelmann's contributions to botany.

PROF. J. MACOUN, botanist to the Geological Survey of Canada, is preparing a report on Canadian fungi, to be fully illustrated with plates.

DR. PARRY has gone to St. Louis to consult with Dr. Engelmann's son in regard to the disposal of his father's valuable collection and notes.

THE FOURTH VOLUME of Proceedings of the Davenport Academy of Sciences, now printing, will contain an unusual number of botanical papers.

ACCORDING TO RECENT studies of M. Cornu, the oospores of *Peronospora*, when buried at a considerable depth, may retain their vitality from two to five years.

PROF. J. C. ARTHUR has accepted the position of botanist to the New York Agricultural Experiment Station, and has already entered upon his duties at Geneva.

IN THE LAST REPORT of the Ottawa Field-Naturalists' Club, we note that the botanical branch report twenty-four additions to the *Flora Ottawaensis* during the last season.

S. E. CASSINO announces that he will soon issue a translation of Dr. Behren's book "On the use of the Microscope in Botany," translated by Rev. A. B. Hervey, and assisted by Prof. R. H. Ward.

"A BRIEFER COURSE IN BOTANY," by Professor C. E. Bessey, will soon be issued from the press of Henry Holt & Co. It is to be a concise introduction to the science, adapted to the use of common and high schools.

THERE IS A CURIOUS but rather appalling mistake in proof reading in the last GAZETTE. On page 44 it says that the French expended 30,000,000 "lives," when it should have said "livres," which makes some difference.

DR. A. S. BALDWIN FINDS that the number of growth rings in trees of Northern Florida can be explained by reference to the weather record, a ring being formed whenever the growth is checked, whether by cold or drought.

THE BILL BEFORE Congress for the establishment of "National Experiment Stations" ought to pass. The provisions of the bill are probably as good as could be expected, and if the work is in the hands of a competent director, the results can not fail to be very profitable to agriculture, and botanical science in general.

ACCORDING TO A recent note in *Science*, the Harvard College Herbarium has received during the past year 8,755 sheets of plants, over 5,000 of which came from the rich herbarium of the late George Curling Joad, of Wimbledon, near London.

SCIENCE OF FEBRUARY 15th says some earnest words regarding the value of the botanical researches which may be undertaken by agricultural experiment stations, and the high position which their great practical importance should secure.

DR. E. L. STURTEVANT has published for private distribution a pamphlet entitled, "Maize: an attempt at Classification." It is profusely illustrated with cross-sections of seeds, which show plainly the characters upon which the classification is based.

LIEUT. SCHWATKA collected some plants about the headquarters of the Yukon, which have been determined by Sereno Watson. *Erysimum parviflorum*, *Amelanchier alnifolia*, *Pentstemon confertus*, and *P. glaucus* (?) are mentioned as new to so northern a latitude.

PROF. BESSEY, in the March *Naturalist*, suggests a neat demonstration of the flow of sap. If a small branch is cut from a maple tree during a cold day, and warmed quickly, the water will flow freely. On cooling it the flow ceases, and warming again causes the flow to be resumed.

DR. J. B. DE LACERDA has been investigating the disease known in Brazil as "beriberi." The work has been done in the physiological laboratory of the National Museum of Rio de Janeiro, the method of Pasteur being employed. The conclusions are that it is a parasitic disease, and that it seems to be conveyed to its victims by rice, apparently the same microphyte being obtained in the blood culture from beriberi patients and the culture of contaminated rice grains.

AT A RECENT meeting of the Ottawa (Canada) Field Naturalists' Club, Prof. J. Macoun read a paper on "Edible and Poisonous Fungi," stating that owing to the difficulty of distinguishing between good and bad kinds at sight, it is always advisable to partake lightly at first of such as are not certainly known to be non-poisonous. Those with an agreeable taste and odor will usually prove, however, to be harmless. He advised the more extensive use of these plants, and described a number of the more abundant alimentary species, such as *Coprinus comatus*, *Morchella esculenta*, *Gyromitra esculenta*, and the Lycoperdons.

DR. C. C. PARRY has in press a revision of the genus *Chorizanthe*, of which we have been permitted to see some advanced sheets. With this revision Dr. Parry intends to send out specimens, as can be seen from his advertisement. All the species but one have been examined by him, and most of them seen growing. With such facilities for study it is surprising that no more changes have to be made. Three species are reduced, *C. diffusa*, *C. cuspidata*, and *C. Wheeleri*; the monotypic genus *Lastarriwa* becomes *C. Lastarriwa*; and one new species is described, *C. Clevelandi*. We shall defer a more extended notice until the publication of the revision.

IN SCIENCE of Feb. 29, Joseph F. James gives an interesting account of the expulsion of water from a Caladium leaf. A new leaf being ready to expand by the side of an old one, the latter was cut off. Afterwards, from the stump end, jets of water began to be thrown to a height of an inch, and with a regular pulsation of about 180 per minute. This was kept up for two or three days, the rate gradually diminishing. It seems that other members of the Aroid family have been caught in the same performance, and in 1672 an account was published describing water expelled from the leaves of some aroids, resembling a fountain. These large stories are always the oldest.

MR. FRANK M. DAY has published, in the proceedings of the Am. Phil. Soc., Philadelphia, a paper on "The Microscopic Examination of Timber with regard to its strength," accompanied by four plates. It is a subject opened up recently by Dr. J. T. Rothrock, and developed by Mr. Day under his advice and with his assistance. It is well done, and comes from the Eli K. Price Botanical Laboratory of the University of Pennsylvania. We should have more such laboratories, and existing ones should be better equipped for exact and profitable work. The trouble is that boards of managers generally belong to the last generation and seem to be unable to conceive of the importance of such work.

IN A PAPER PRESENTED to the Royal Society of London, Prof. Alexander Dickson called especial attention to a series of remarkable glands which occur in the corrugated annulus which forms the rim of the pitcher of *Cephalotus*. If the inflexed rim of the pitcher be examined a number of openings may be found, alternating with the corrugations of the annulus. Each orifice is continued inwards as a canal-like fossa, at the bottom of which projects a nipple-shaped body. This body is the free apex of a gigantic gland, the bulk of which is imbedded in the parenchyma of the annulus. These glands may be truly denominated gigantic, as they range from .68^{mm} to 2.11^{mm} in length, according to the species. The function of these glands is probably the secretion of honey as a lure to insects.

PROF. WILLIAM BUCKHOUT, of Agricultural College, Pa., has been cultivating some of Mr. Lemmon's Arizona potatoes, and gives the first results in the March *Gardener's Monthly*. His first crop he pronounces to be simply diminutives of the cultivated potatoes. They changed color and quality so quickly when exposed to light that no fair test of their edibility could be made. As Prof. Buckhout says, it is absurd to expect any immediate results from the cultivation of this potato. If anything is going to be made of it, it must be by a long-continued series of carefully selected cultures. The queer thing is, though, that in the very same number is a letter from Prof. Lemmon, in which he gives the experience of E. S. Mumford, of Portlandville, N. Y., and his experience is that the tubers do not change color soon upon exposure to light, and that they are double the size of the one planted. As between the Pennsylvania and New York crops, the latter is the one to be further cultivated.

THE TIME has now come when botanists should be arranging to visit Philadelphia next summer. The delightful personal intercourse enjoyed last summer at Minneapolis makes those who were there very desirous of its repetition in

greater measure in Philadelphia. The Botanical Club that was organized with as little organization as possible will try to make it very profitable to botanists in the way of becoming acquainted with fellow-workers and examining under competent guidance the interesting plants of the vicinity. We venture to say that the ballast grounds will be well ransacked and many of its waifs added to our collections. Questions of postage are also to be discussed, and it is to be hoped that something definite can be arranged with the postal authorities. Many instances of mismanagement and injustice have already been reported to the committee, and we doubt not that some are yet to be heard from. With such definite complaints something can be accomplished.

PROF. T. CARUEL, of Florence, in 1881 presented to the Linnean Academy a treatise upon the classification of plants. It has now been re-edited by the author, in French, under the title, *Pensées sur la Taxonomie Botanique*, and published last year in Engler's Botanische Jahrbücher. So far as Phanerogams are concerned, Gymnosperms are given their proper position in relation to the higher Cryptogams, and Angiosperms begin with Monocotyledons. As every one now consents to this arrangement, the question naturally arises, When are we going to begin to use it? Prof. Caruel also discards our old divisions of *Polypetalæ*, *Gamopetalæ*, and *Apetalæ*, which every systematic botanist has long seen are too artificial to stand, and substitutes the cohorts *Dichlamydanthæ*, *Monochlamydanthæ*, and *Dimorphanthæ*. We would suggest that when the change has to come that shorter names be devised, for they must be used by many who could neither spell nor pronounce such names as the above. According to Dr. Gray, the first cohort includes Gamopetalous and Polypetalous orders generally; the second all the Candollean orders from Ranunculaceæ to Fumariaceæ, the Cactaceæ, Portulacaceæ, etc.; the third has Begoniaceæ, Euphorbiaceæ, Urticaceæ, etc., and the Amentaceous orders. Some Jussieu or DeCandolle must arise and give us a new arrangement.

CURRENT LITERATURE.

Elementary Botany, with student's guide to the examination and description of plants. By George Macloskie, D.Sc., LL.D., Professor of Natural History in the J. C. Green School of Science, Princeton, N. J., etc. New York: Henry Holt & Co., 1883. pp. VIII, 373.

One who receives a new elementary botany now-a-days, turns to its examination in a somewhat skeptical frame of mind, hardly daring to hope that he will find in it any thing fresh or new, so often have former hopes been disappointed. But any one who begins to peruse this book will speedily become roused to the consciousness that here is really something far above the average run of text-books. It is doubtful, indeed, whether this one should be called a text-book, because the author tells us that he has aimed "to supply a readable sketch of botany, followed by a guide to work in the field and in the laboratory." It is not always that a book corresponds to the aim of an author, as stated in his preface. This, however, surely does, for it is one of the *most readable* books yet come into our hands. The style is admirably clear and vigorous, the pages unencumbered with technicalities (though technical terms are never

dodged when needed), and the subject matter permeated with a subdued ætiological philosophy, which adds vivacity to the whole. Moreover, the book embodies the latest views of botanists in all departments of the science. Best of all, it is made evident to every reader or student at the very outset, that he is not expected to get his knowledge of botany from the pages which follow, but by personal investigation. Part I, treating of the parts of plants, is wholly occupied with the thorough examination of the "morning-glory" as preliminary to Part II, the structure of flowering plants. Part III discusses the flowerless plants; IV, herborizing and manipulation; V, the vegetable kingdom, including chapters on the external relations of plants, classification and a synopsis of classes and orders; VI, is a general guide for examining and describing plants; VII, special schedules for Cruciferæ, Umbelliferæ, Compositæ, Gramineæ and Ferns; VIII, contains alphabetical lists of Latin and Greek root words, numerals and prefixes. The last part is an admirable thought, helpful alike to teacher and pupil. In connection with parts six and seven, we wish heartily to indorse this remark in the preface, that "it is better and more interesting to spend the leisure of a whole season on a single species than to hurry over a great number merely for the sake of discovering their names." Would that every student could be impressed with that idea.

Possessing these many good qualities, there are unavoidably some defects, but these are so comparatively unimportant that they do not need special mention. Dr. Macloskie is to be congratulated that he has produced a book which is sufficiently complete, reliable and interesting to be placed in the hands of students; one which directs them to observe for themselves and not to memorize; and one, withal, quite original in manner and arrangement.

Characeæ Americanæ Exsiccatæ, distributæ a T. F. Allen, M. D. Fasciculus IV., No. 31–40[a].

The work of Dr. Allen in investigating and making known our Characean flora is worthy of high commendation. His well illustrated papers in the *Bulletin of the Torrey Club*, supplemented by the present series of exsiccatæ, which are distributed with much liberality, make it possible to collect and study the American species in quite an intelligent and satisfactory manner; and none of the lower plants commend themselves more favorably to the attention of collectors. The present fasciculus contains four species of *Nitella*, three of *Tolypella*, three of *Chara*, and an additional extra-American species of *Nitella* from New Zealand. *Nitella minuta*, a new species, is accompanied by a description.

A Catalogue of the Native and Naturalized Plants of the City of Buffalo and its Vicinity. By David F. Day. 8vo., 215 pp. Buffalo.

This is surely the most complete local American catalogue we have yet seen, for it includes both Phænogams and Cryptogams. It is prefaced by a dozen pages defining the region covered and describing all the necessary surface features, and closes with a tabular view of the orders, an important supplement, and an index of genera. Considering that the list embraces only those plants which have been satisfactorily identified, growing within a radius of 50 miles around Buffalo, 2739 species show a most commendable amount of exploration. The fungi are from the hands of Mr. Chas. Peck, a fact which gives this unusual portion of the catalogue an authentic character. Mr. Day is certainly to be congratulated upon such a successful completion of a work which must have taken a great amount of time and labor. Among Phænogams, the Compositæ number 143 species, Cyperaceæ 105, Gramineæ 88, Rosaceæ 52, Leguminosæ 45, Labiatæ 39, Ranunculaceæ and Cruciferæ 36 each, Orchidaceæ 34, Liliaceæ 31, Scrophulariaceæ 30, etc., an order of abundance decidedly different from that found in the flora of Indiana.

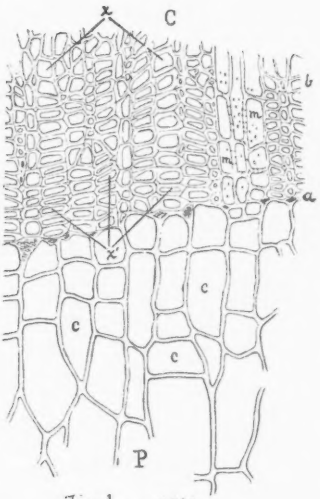

Fig. 1. x 230

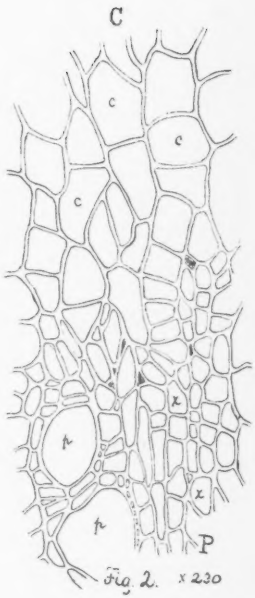

Fig. 2. x 230

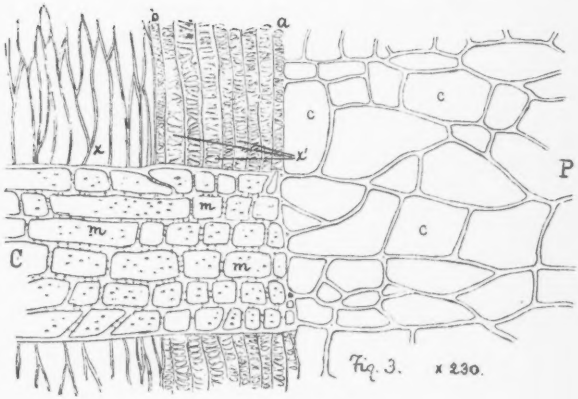

Fig. 3. x 230.

BARNES ON CORK IN CATALPA.